



*Computational Mechanics Graduate Program*

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**Course Syllabus: CMGP 10 Vibrations**

*Instructors: Dr. S. El-Borgi, Dr. B. Jemai*

**Course Outline:**

1. Vibration of distributed parameter system: Exact methods (2 lectures)
2. Vibration of distributed parameter system: Approximate methods (1 lecture)
3. Vibration of SDOF and MDOF systems: Numerical solutions in the time domain (1 lecture)
4. Nonlinear vibrations: Qualitative methods (2 lectures)
5. Nonlinear vibrations: Quantitative methods (2 lectures)
6. Theory of plates: Static and Dynamic Loading (2 lectures)
7. Random Vibration (1 or 2 lectures)

**Course Offering:**

Quarter 2 of each academic year (Required Course; 45 hours total; 4.5 Credit hours)

**Course Grade:** Homework (30%); Exam (70%)

**References:**

- Meirovitch, L., "*Fundamentals of Vibration*", McGraw-Hill, 2001.
- Humar, J.L., "*Dynamics of Structures*", 2<sup>nd</sup> Edition, Prentice Hall, 2002.
- Chopra, A.K., "*Structural Dynamics: Theory and Applications to Earthquake Engineering*", Prentice Hall, 2001.
- Paz, M., "*Structural Dynamics: Theory and Computation*", 4<sup>th</sup> Edition, Chapman Hall, 1997.
- Benaroya, H., "*Mechanical Vibration: Analysis, Uncertainties and Control*", Prentice Hall, 1998.
- Clough, R. and Penzien, J., "*Dynamics of Structures*", Second Edition, McGrawHill, 1993